

IERG4210

2022 Spring

Tutorial 1

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Outline

- Course Introduction
- Assignments
- Useful Tools
- Tips on Phase 1
- Q&A

Course Introduction

- Course Website
 - <http://course.ie.cuhk.edu.hk/~ierg4210>
 - VPN needed
- Course Bulletin: CUHK Blackboard
 - Latest Announcement
 - You are supposed to check your university mailbox regularly
 - **Assignment Submission**

Course Introduction

- Main Focus
 - Before Mid-Term » Basic Knowledge on Website
 - Languages: HTML, CSS, JS, PHP, ...
 - Client side & Server side
 - Authentication & Authorization
 - After Mid-Term » Web Security
 - Well-known Attacks: CSRF, XSS, SQL-Injection, ...
 - Security Consolidation: TLS; Web browser security
 - Usability: Performance & SEO
- Security is the essential part

Assignments

- “Active learning” to supplement “passive learning” from the lectures
- To make your hands dirty and being well-prepared for job interviews
- Features
 - Develop a **well-functioning** and **secure** shopping website
 - Your grades will base on each individual phases and a final demo
 - You are free to choose languages, frameworks, and tools as long as you understand what your code does when being asked

Assignments

- You have to submit at each phase
 - tarball/package all your **codes & resource files** to make sure TAs can run your website on his/her own machine
 - attach a **readme** file to make TAs more clear about your submission, including but not limited to
 - How to run your website?
(some students use frameworks that need an installation)
 - What are different folders/files used for (utils, res, dev, ...)
 - delete unnecessary/unrelated files before your submission
 - backup, your self-note, trail files, etc.

Assignments

- Two sub-grades
 - TAs will sample your submissions and track your progress
 - Find those who are falling behind and remind him/her personally
 - Invite weaker students to attend an **interim demo**
 - **Do not try to use “interim demo” as an excuse for late submission!**
 - You will get two grades
 - after the deadline of phase 3
 - after the final demo
- Your final grades will base on two sub-grades

Useful Tools


- Version Control Tool
 - Git & Github
 - Maintain your history versions
- Code Editors
 - PC-side: notepad++ (win), sublime text (cross-platform), atom (cross), visual code (cross)
 - Server-side: Vi, Vim, Emacs
- Powerful IDE
 - JetBrains (free student licenses)
- Debug your code
 - Firefox Firebug; Chrome Developer Tool; Safari Web Inspector ...

Git & Github

- Sign up at github.com
- Create a new **repository** for your project
 - By default it is public » Everyone can see your codes
- (optional) Apply **Github Student Developer Pack**
 - Enjoy a lot of promotions (Use your school email)
 - You can set up as many **private repos** as you like
 - <https://education.github.com/pack>
- Basic Commands
 - `git clone`
 - `git add`
 - `git commit -m "xxx"`
 - `git push`

Student Developer Pack

The best developer tools, free for students



Learn to ship software like a pro

Like 43K Tweet

There's no substitute for hands-on experience, but for most students, real world tools can be cost prohibitive. That's why we created the GitHub Student Developer Pack with some of our partners and friends: to give students free access to the best developer tools in one place so they can learn by doing.

Get your pack

Code Editor



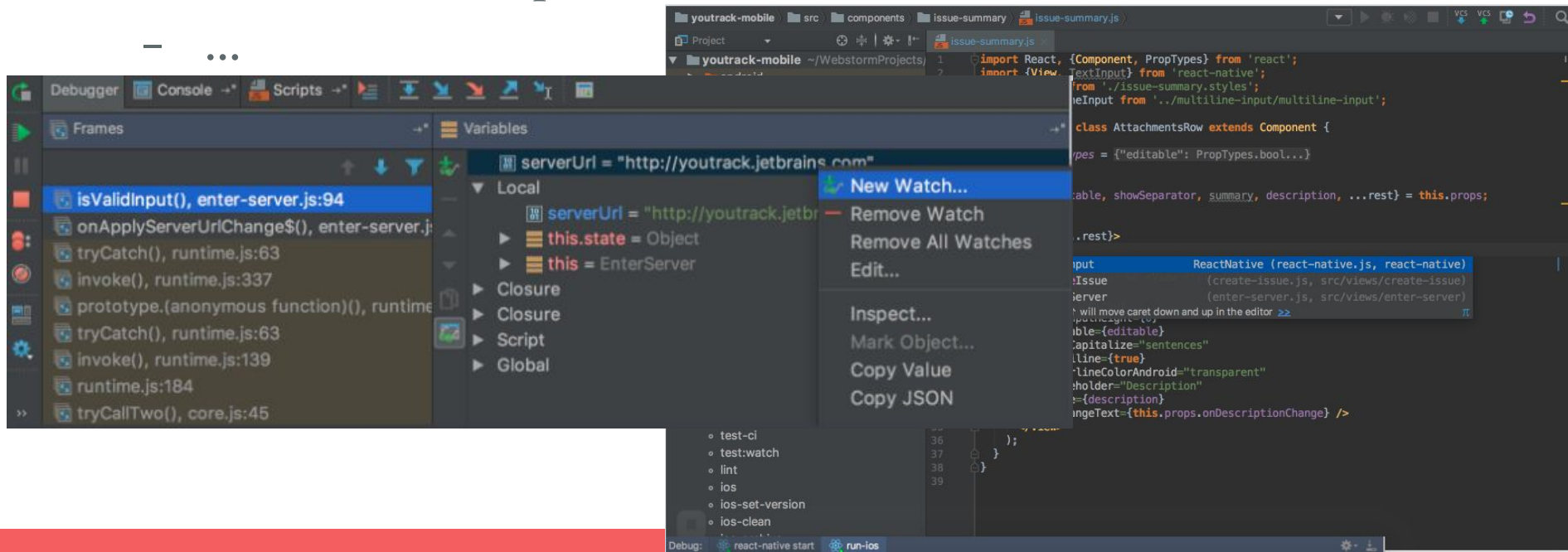
- Lightweight and convenient
- Many **plugins/configs** to enhance its capabilities

The screenshot shows the Visual Studio Code interface. On the left, a terminal window is open, displaying the Vim help screen for version 8.0.1176. The text in the terminal is green on a black background. A red arrow points to the command `:set spell` at the bottom of the terminal. On the right, the code editor is open, showing a TypeScript file. The code includes imports for `debug` and `http`, and a function definition. The status bar at the bottom indicates the current file is `Ln 9, Col 21`, with `Spaces: 2`, `UTF-8` encoding, and `LF` line endings. The bottom status bar also shows the current branch as `master` and the number of changes as `1: 13, 0: 0`.

Powerful IDEs



- Integrated Development Environment
- Heavyweight, numerous features
 - Debugging
 - Version Control
 - Remote Development
 - ...



Phase 1 Outline

- HTML
- CSS
- JS
- Hints (for Phase 1)

Tips on Phase 1

- Html and CSS have numerous tags/features
 - Try to play with them over some online playground
 - <https://htmlcheatsheet.com>
 - Interactive
- Good isolation of different files
 - HTML, CSS, and JS
- CSS tableless table
 - Do not use <table> tag for layout » Why?
 - keywords: adaptive design, responsive design
- Learn from good examples
 - e.g., parknshop.com

Structure

- Clean Separation
 - Structure and content: HTML
 - Presentation: CSS
 - Behavior: JavaScript (No inline CSS and JS)
- Create a folder to put all images inside
 - xxx.html
 - xxx.css
 - xxx.js
 - images(folder)
 - descriptive_name_for_your_image.jpg

HTML

- HyperText Markup Language
- not a programming language but a formatting (markup) language

```
<tagname attribute="value">
```

```
    content
```

```
</tagname>
```

```
<tagname id="id" class="class1 class2">
```

```
    content
```

```
</tagname>
```

ID – unique element

Class – similar elements

HTML

- Semantic tags
 - `<header>` `<nav>` `<footer>` `<article>` `<section>` `<div>` `` `...`
 - No tags for styling use, e.g., `<center>`
- Reference: <http://www.w3schools.com>

HTML 5 Template

```
<!DOCTYPE html> <!--HTML Version-->
<html lang="en">
<head>
  <meta charset="UTF-8"> <!--encoding-->
  <title>Your Page Title!</title>
  <link rel="stylesheet" href="xxx.css" type="text/css">
</head>
<body>

  <!--YOU CONTENT HERE!-->

  <script src="xxx.js" type="text/javascript"></script>
</body>
</html>
```

Tip -- where to include the JavaScript files

- `<head>`

```
.....  
<script src="xxx.js" type="text/javascript"></script>  
</head>
```

The browser firstly loads the js file and the body will not be loaded until completing js loading. It will waste users' time and may cause some problems.

- `<body>`

```
..... <!--YOU CONTENT HERE!-->  
<script src="xxx.js" type="text/javascript"></script>  
</body>
```

CSS

- Cascading Style Sheets
- Include CSS

Inline `<p style="color: red;">Hello World </p>`

Embedded `<head>`
 `<style type="text/css"> p { color : red;}`
 `</style>`
 `</head>`

External `<link rel="stylesheet" href="mystyle.css" type="text/css">`

- Declaration-3 parts

| Selector | Property | Value |
|----------------|----------------------|------------------------|
| <code>p</code> | <code>{ color</code> | <code>: blue ;}</code> |

CSS – the selector

- Ways to

select

-element

p { }

-class and id

.class1 { } #id1 { }

-position

<div id="help">

<p class="good bad"></p>

<p class="good"></p>

</div>

#help p { } p.bad { } p.good { } a:link { }

-pseudo class

a:visited { } a:hover { } a:active { }

li:nth-child() { }

CSS – the properties and values

font color border.....

- Each **property** has a set of **values** that can be applied

border: 1px solid red;

- Properties come in different **granularities**

border: border-color border-bottom
 border-width border-bottom-color
 border-bottom-width

border: 1px solid red;

is the same as

border-width: 1px;
border-style: solid;
border-color: red;

change specific parts of
an element's style.

CSS - units

- Units are the measurement sizes of things.
- **Absolute** always same size in different screens
 - px
 - (pixels)
- **Relative** relative to the current value of font-size relative to different things in different contexts
 - e
 - em
 - %

example:

```
body { font-size:12px; }  
h1 { font-size:200%; }  
h1 a { font-size:75% }
```

result: $12 * 200\% \text{ px} \Rightarrow 12 * 200\% * 75\% \text{ px}$

CSS – the precedence

- Rule: The **last** and **most specific** declaration wins

e.g. `p{ color: red; }`

e.g. `p{ color: blue; }` ✓

```
<div id="a">  
  <div id="b">  
    <h1>Hello</h1>  
  </div>  
</div>
```

```
#a #b h1 { color: red;}
```

✓

```
#a h1 { color: blue;}
```

Point
system
I. C. E.
100 10 1

CSS - Layout

- Box Model

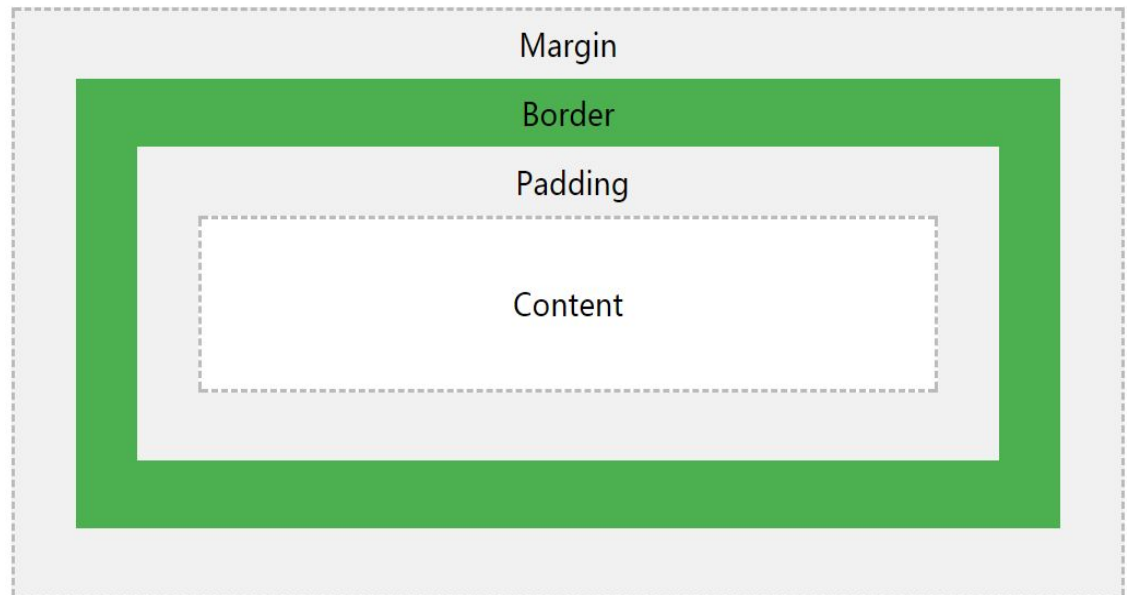
margin border padding content

- Display (property)

inline block none ...

- Position

(property) static
(default) relative
absolute
fixed



JavaScript - jQuery

- Note: The exam - basic JS
- JavaScript Library - simplify programming
 - DOM manipulation
 - Event handling
 - Animation
 - Ajax...
- To Use
 - `<script type="text/javascript" src="jquery-3.3.1.min.js"></script>`

jQuery - Basic

- Note: The exam - basic JS
- JavaScript Library - simplify programming
 - DOM manipulation
 - Event handling
 - Animation
 - Ajax...
- To Use
 - `<script type="text/javascript" src="jquery-3.3.1.min.js"></script>`

JavaScript:

```
document.getElementById('id1');  
document.getElementsByTagName('p')  
; document.querySelector();
```

jQuery - Basic

- Events

- Mouse, Keyboard: e.g., click, mouseenter, keypress...
- Form events, Document events

- Events Methods

- `$("#test").click(function(){
//your code goes here});`
- `$("#test").on("click", function(){
//your code goes here });`

JavaScript:

```
var el= document.getElementById('id1');  
var doSomething = function (){ ... };  
el.addEventListener('click',doSomething,false);
```

jQuery - Basic

- More about jQuery
 - DOM manipulation, e.g., `$("#test").html("<p>Hello!</p>")`
 - CSS manipulation, e.g., `$("#test").css("background-color", "red");`
 - Effects, e.g., `animate()`, `fadeIn()`...
 - Ajax (useful in later phase)
 - ...
- <https://jquery.com>



Tags

Div Section

<div>Block element</div>

Headings

<h1>Page title</h1>

<h2>Subheading</h2>

<h3>Tertiary heading</h3>

<h4>Quaternary heading</h4>

Paragraph

<p style="text-align: center;">text</p>

Image

Outbound Link

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<a href="https://htmlg.com/" target="_blank" rel="r

Mailto link

<a href="mailto:me@ruwix.com?Subject=Hi%20mate" ta

border: 3px solid #CE5937;

Box border

text-shadow: 1px 2px 2px #CE593

Text shadow

box-shadow: 2px 2px 7px 1px #CE

Box shadow

Structures

Table

<table><caption>Phone numbers</caption>

<thead>

<tr>

<th>Name</th>

<th colspan="2">Phone</th>

</tr>

</thead>

<tbody>

<tr>

<td>John</td>

<td>577854</td>

<td>577855</td>

</tr>

<tr>

<td>Jack</td>

<td>577856</td>

<td>577857</td>

</tr>

</tbody>

<tfoot>

</tfoot>

</table>

HTML

CSS

JS

jQuery

AMP

All Characters

Attributes

SYNTAX

<tag attributename="value" />

HTML

```
1 <h1>Page title</h1>
2 <h2>Subheading</h2>
3 <h3>Tertiary heading</h3>
4 <h4>Quaternary heading</h4>
5
```

CSS

```
1
```

Preview

Page title

Subheading

Tertiary heading

Quaternary heading

h1